

48. A solid comprising crystalline C₆₀.

49. A carbon product comprising a mixture of crystalline C₆₀ molecules and crystalline C₇₀ molecules.

50. A carbon product comprising crystalline C₆₀.

51. A carbon product comprising crystalline C₇₀.

52. An amorphous or crystalline solid which exhibits the following properties:

(a) a mass spectrum m/e peak at 720 amu;

(b) an infrared spectrum having absorptions at 1424, 1183, 577 and 528 cm⁻¹;

(c) an ultraviolet spectrum having the absorption pattern of Figure 4;

(d) soluble in non-polar organic solvents; and

(e) sublimes at a temperature ranging from about 300°C to 400°C.

53. A solid carbon product prepared by the process

comprising:

(a) vaporizing carbon in the presence of an inert quenching gas under conditions effective to provide a sooty carbon product comprising C₆₀ molecules;

(b) depositing the sooty carbon product on a collecting substrate;

(c) removing the sooty carbon product from the collecting substrate;

(d) contacting the sooty carbon product with a non-polar organic solvent effective to dissolve C₆₀ molecules, said solvent being present in an amount effective to dissolve the C₆₀ molecules in said sooty carbon product; and

(e) recovering from said solvent a solid carbon product comprising C₆₀ molecules.

54. The solid carbon product of Claim 53 in which the carbon in step (a) is vaporized in an evacuated reactor.

55. The solid carbon product of Claim 54 in which the carbon step (a) is vaporized in an evacuated bell jar.

56. The solid carbon product of Claim 53 in which the carbon subject to vaporization in step (a) is graphite.

57. The solid carbon product of Claim 53 in which the carbon subject to vaporization in step (a) is graphite rods.

58. The solid carbon product of Claim 53 wherein the carbon is vaporized in step (a) by passing an electrical current of sufficient intensity to produce the sooty carbon product.

59. The solid carbon product of Claim 58 wherein the electrical current is about 100 amps.

60. The solid carbon product of Claim 53 wherein the inert quenching gas of step (a) is a noble gas.

61. The solid carbon product of Claim 53 wherein the carbon is vaporized in step (a) at a pressure ranging from 50 torr to 400 torr.

62. The solid carbon product of Claim 61 wherein the carbon is vaporized in step (a) at approximately 100 torr.

63. The solid carbon product of Claim 53 wherein the carbon is vaporized in step (a) at a pressure ranging from about 2 to 3 atmospheres.

64. The solid carbon product of Claim 53 wherein the collecting substrate in step (b) is a glass surface.

65. The solid carbon product of Claim 60 wherein the inert gas is helium or argon.

66. The solid carbon product of Claim 53 wherein the non-polar organic solvent of step (d) is carbon disulfide, benzene, carbon tetrachloride or toluene.

67. The solid carbon product of Claim 66 wherein the solvent is benzene.

68. The solid carbon product of Claim 66 wherein the solvent is carbon tetrachloride.

69. The solid carbon product of Claim 53 wherein recovery step (e) comprises evaporating the solvent.

70. The solid carbon product of Claim 53 further comprising C_{60} .

71. The solid carbon product of Claim 53 further comprising:

(f) purifying the carbon product of step (e) to obtain C_{60} .

72. The solid product of Claim 71 wherein the purification of step (f) is sublimation at 300-400°C, fractional crystallization, column chromatography, capillary electrophoresis, HPLC, preparative-thin layer chromatography, crystallization or extraction.

73. A formed or molded product comprising crystalline C_{60} .

74. The product according to Claim 73 which is extended in at least one direction.

75. A free flowing particulate comprised of crystalline C_{60} .

76. A brownish-red carbon allotrope.

77. A solid comprising crystalline C_{70} .

78. A carbon product comprising crystalline C_{70} .

79. An amorphous or crystalline solid having the following properties:

(a) the mass spectrum having a m/e peak at 840 amu;

(b) the ultraviolet spectrum having an absorption peak at 216 nm;